

REMARKS

Claims 11, 14, 17, 19-55, 57-59, 62, 65-71, 75-79, and 81- 83 are pending in the application with claims 6, 7, 15, 16, 18, 56, 74, and 80 being cancelled without prejudice by the foregoing amendment. Claim 83 is newly added by the foregoing amendment. Support for newly added claim 83 can be found in the specification on page 11, line 5 through page 13, line 7. Claims 18, 25, 28, 46-48, and 81 are objected to because of informalities. Claim 56 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 6 and 7 are rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 5,459,021 to Ito (hereinafter "Ito"). Claims 6 and 7 are rejected under 35 U.S.C. § 102(b) by Japanese Patent Abstract JP 2000-334881 to Kita et al. (hereinafter "Kita '881"). Claim 6 is rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,468,725 to Takamuki (hereinafter "Takamuki"). Claim 6 is rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,468,717 to Kita et al. (hereinafter "Kita '717"). Claims 14-17, 19, 20, 22, 23, 25, 26, 28, 30, 31, 34, 35, 37, 74-76, 79, 81, and 82 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gonsalves et al., Combinatorial Approach for the Synthesis of Terpolymers and Their Novel Application as Very-high-contrast Resists for X-ray Nanolithography, *Journal of Vacuum Science Technology*, B 18(1), Jan/Feb 2000, pp. 325-327 (hereinafter "Gonsalves"). Claims 6, 7, 14, 15, 17, 19-21, 74-78, and 80-82 are rejected under 35 U.S.C. § 102(a) as being anticipated by Hu et al., Nanocomposite Resists for Electron Beam Nanolithography, *Microelectronic Engineering*, 56 (2001), pp. 289-294 (hereinafter "Hu"). Claims 22-27, 30-32, 35, and 37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wu et al., Polymer-Inorganic High Contrast and High Sensitivity Resists for Nanolithography, *Materials Research Society Symposium Proceedings*, 584 pp. 121-128 (2000) (hereinafter "Wu"). Claims 22-24, 26, and 27 are rejected under 35 U.S.C. § 102(b) as being anticipated by Pyun et al., Synthesis of Organic/Inorganic Hybrid Materials from Polysiloxane Precursors Using Atom Transfer Radical Polymerization, *Polymer Preprint*, 40(2), pp. 454-455 (1999) (hereinafter "Pyun"). Claims 38, 39, 47, 51, 52, 57, and 59 are

rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 5,965,325 to Matsuo et al. (hereinafter “Matsuo”). Claims 38, 42, 43, 47, 48, 51, 55, and 62 are rejected under 35 U.S.C. § 102(a) as being anticipated by Wu et al., A Novel Single-Component Negative Resist for DUV and Electron Beam Lithography, *Advanced Materials*, 2001, 13(3), pp. 195-197 (hereinafter “Wu Adv”). Claim 34 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu in view of United States Patent No. 4,225,664 to Moran et al. (hereinafter “Moran”). Claims 30-32, 35, and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pyun in view of Wu. Claim 34 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pyun in view of Wu. Claim 57 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu Adv in view of United States Patent No. 6,479,210 to Kinoshita (hereinafter “Kinoshita”). Claims 6, 7, 14-17, 19, 20, 74-79, 81, and 82 are rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,420,084 to Angelopoulos et al. (hereinafter “Angelopoulos”) in view of Haddad et al., Hybrid Organic-Inorganic Thermoplastics: Styryl-Based Polyhedral Oligomeric Silsesquioxane Polymers, *Macromolecules*, 1996, 29, pp. 7302-7304 (hereinafter “Haddad”).

Applicant has amended claims 14, 17, 22, 25, 28, 38, 46-48, and 81. Support for the claim amendments is found throughout the specification and is discussed further below. Applicant has cancelled claims 6, 7, 15, 16, 18, 56, 74, and 80 without prejudice to introduction in a subsequent application.

Claim Objections

Claims 18, 25, 28, 46-48, and 81 are objected to because of informalities. Applicant has cancelled claim 18 without prejudice to introduction in a subsequent application thereby rendering the objection to claim 18 moot. Applicant has amended claims 25, 28, 46-48, and 81 in compliance with the Examiner's suggestions. As a result, Applicant respectfully requests that the objections to claims 25, 28, 46-48 and 81 be withdrawn.

Claim 56 and 35 U.S.C. § 112, Second Paragraph

Claim 56 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Applicant has cancelled claim 56 without prejudice to introduction in a subsequent application. The cancellation of claim 56 renders the present rejection moot, and Applicant respectfully requests that the Examiner withdraw the rejection.

Claims 6 and 7 and 35 U.S.C. § 102(b)

Claims 6 and 7 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ito. Applicant has cancelled claims 6 and 7 without prejudice to introduction in a subsequent application. The cancellation of claims 6 and 7 renders the present rejection moot, and Applicant respectfully requests that the present rejection be withdrawn.

Claims 6 and 7 and 35 U.S.C. § 102(b)

Claims 6 and 7 are rejected under 35 U.S.C. § 102(b) as being anticipated by Kita '881. Applicant has cancelled claims 6 and 7 without prejudice to introduction in a subsequent application. The cancellation of claims 6 and 7 renders the present rejection moot, and Applicant respectfully requests that the present rejection be withdrawn.

Claim 6 and 35 U.S.C. § 102(e)

Claim 6 is rejected under 35 U.S.C. § 102(e) as being anticipated by Takamuki. Applicant has cancelled claim 6 without prejudice to introduction in a subsequent application. The cancellation of claim 6 renders the present rejection moot, and Applicant respectfully requests that the present rejection be withdrawn.

Claim 6 and 35 U.S.C. § 102(e)

Claim 6 is rejected under 35 U.S.C. § 102(e) as being anticipated by Kita '717. Applicant has cancelled claim 6 without prejudice to introduction in a subsequent application. The cancellation of claim 6 renders the present rejection moot, and Applicant respectfully requests that the Examiner withdraw the present rejection.

Claims 14-17, 19, 20, 22, 23, 25, 26, 28, 30, 31, 34, 35, 37, 74-76, 79, 81, and 82 and 35 U.S.C. § 102(b)

Claims 14-17, 19, 20, 22, 23, 25, 26, 28, 30, 31, 34, 35, 37, 74-76, 79, 81, and 82 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gonsalves.

A. Claims 14-17, 19, 20, 75, 76, 81, and 82

Applicant has amended claim 14 to recite a lithographic process comprising a lithographic recording medium wherein the recording medium comprises a nanocomposite resist comprising a nanoparticle component and a polymer component, the nanoparticle component comprising a polyhedral oligosilsesquioxane and the polymer component comprising poly(α -chloroacrylate-*co*- α -methyl styrene). Support for the present amendment can be found in the specification on page 11, line 21 through page 13, line 7.

Gonsalves does not describe or teach a lithographic resist comprising a poly(α -chloroacrylate-*co*- α -methyl styrene). The Examiner recognizes the patentability of the resist recited in claim 14 by stating "none of the cited prior arts teaches or suggests the present combination of a polyhedral oligosilsesquioxane and poly(α -chloroacrylate-*co*- α -methyl styrene)."¹ As a result, Applicant respectfully asserts that claim 14 is not anticipated by Gonsalves and respectfully requests that the Examiner withdraw the present rejection. As claims 17, 19, 20, 75, 76, 81, and 82 depend from and further limit claim 14, Applicant respectfully asserts that these claims are additionally not anticipated

¹ Office Action Mailed November 2, 2004, page 24, § 36.

by Gonsalves and respectfully requests that the Examiner withdraw the rejection of these claims as well.

B. Claims 22, 23, 25, 26, and 28

Applicant has amended claim 22 to recite a polymeric chemically amplified resist comprising a methacrylate component, a polyhedral oligosilsequioxane component, and a photoacid generating component. Support for the present claim amendment can be found in the specification on page 18, line 29 through page 20, line 17 and in Example 7.

Gonsalves does not describe or teach a chemically amplified resist as recited in claim 22. The resists disclosed by Gonsalves operate under chain-scission principles and not chemical amplification.² Accordingly, the resists in Gonsalves do not describe or teach a photoacid generating component necessary for chemical amplification processes. As a result, Applicant respectfully asserts that claim 22 is not anticipated by Gonsalves and respectfully requests that the Examiner withdraw the present rejection. As claims 23, 25, 26, and 28 depend from and further limit claim 22, Applicant respectfully asserts that these claims are additionally not anticipated by Gonsalves and respectfully requests that the Examiner withdraw the rejection of these claims as well.

C. Claims 30, 31, 34, 35 and 37

Claim 30 recites a lithographic process comprising the polymeric chemically amplified resist of claim 22. Gonsalves does not describe or teach a lithographic process comprising a polymeric chemically amplified resist. As a result, Applicant respectfully asserts that claim 30 is not anticipated by Gonsalves and respectfully requests that the Examiner withdraw the present rejection. As claims 31, 34, 35, and 37 depend from and further limit claim 30, Applicant respectfully asserts that claims are not anticipated by Gonsalves and respectfully requests that the Examiner withdraw the rejection of these claims as well.

² Gonsalves, 1st Column, page 327.

Claims 6, 7, 14, 15, 17, 19-21, 74-78, and 80-82 and 35 U.S.C. § 102(a)

Claims 6, 7, 14, 15, 17, 19-21, 74-78, and 80-82 are rejected under 35 U.S.C. § 102(a) as being anticipated by Hu.

A. Claims 6, 7, 15, 74, and 80

Applicant has cancelled claims 6, 7, 15, 74, and 80 without prejudice to introduction in a subsequent application. The cancellation of claims 6, 7, 15, 74, and 80 renders their rejection moot, and Applicant respectfully requests that the present rejection of these claims be withdrawn.

B. Claims 14, 17, 19-21, 75-78, and 81-82

As previously discussed, Applicant has amended claim 14 to recite a lithographic process comprising a recording medium wherein the recording medium comprises a nanocomposite resist comprising a nanoparticle component and a polymer component, the nanoparticle component comprising a polyhedral oligosilsesquioxane and the polymer component comprising poly(α -chloroacrylate-*co*- α -methyl styrene). Hu does not describe or teach a recording medium comprising a polyhedral oligosilsesquioxane in combination with poly(α -chloroacrylate-*co*- α -methyl styrene). The Examiner recognizes the patentability of the resist recited in claim 14 by stating “none of the cited prior arts teaches or suggests the present combination of a polyhedral oligosilsesquioxane and poly(α -chloroacrylate-*co*- α -methyl styrene).”³ As a result, Applicant respectfully asserts that claim 14 is not anticipated by Hu and respectfully requests that the Examiner withdraw the present rejection. As claims 17, 19-21, 75-78, and 81-82 depend from and further limit claim 14, Applicant respectfully asserts that these claims are additionally not anticipated by Hu and respectfully requests that the Examiner withdraw the rejection of these claims as well.

³ Office Action Mailed November 2, 2004, page 24, § 36.

Claims 22-27, 30-32, 35, and 37 and 35 U.S.C. § 102(b)

Claims 22-27, 30-32, 35, and 37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wu.

A. Claims 22-27

As previously discussed, Applicant has amended claim 22 to include the recitation of a photoacid generating component. Wu does not describe or teach a resist comprising a photoacid generating component. The resist in Wu operates by a chain-scission mechanism induced by X-ray photoelectrons, which precludes the need for a photoacid generating component. As a result, Applicant respectfully asserts that claim 22 is not anticipated by Wu and respectfully requests that the Examiner withdraw the present rejection. As claims 23-27 depend from and further limit claim 22, Applicant respectfully asserts that these claims are additionally not anticipated by Wu and respectfully requests that the Examiner withdraw the rejection of these claims as well.

B. Claims 30-32, 35, and 37

Claim 30 recites a lithographic process comprising the polymeric chemically amplified resist of claim 22. Wu does not describe or teach a lithographic process comprising a polymeric chemically amplified resist as recited in claim 22. As a result, Applicant respectfully asserts that claim 30 is not anticipated by Wu and respectfully requests that the Examiner withdraw the present rejection. As claims 31, 32, 35, and 37 depend from and further limit claim 30, Applicant respectfully asserts that these claims are additionally not anticipated by Wu and respectfully requests that the Examiner withdraw the present rejection.

Claims 22-24, 26, and 27 and 35 U.S.C. § 102(b)

Claims 22-24, 26, and 27 are rejected under 35 U.S.C. § 102(b) as being anticipated by Pyun. Pyun does not describe or teach a chemically amplified resist comprising a photoacid generating component. Pyun discloses the synthesis of organic/inorganic hybrid materials from polysiloxane precursors using atom transfer radical polymerization. Pyun does not address chemically amplified polymeric resists suitable for lithographic processes. As a result Applicant respectfully asserts that claim 22 is not anticipated by Pyun and respectfully requests that the Examiner withdraw the present rejection. As claims 23, 24, 26, and 27 depend from and further limit claim 22, Applicant respectfully asserts that these claims are also not anticipated by Pyun and respectfully requests that the rejection of these claims be withdrawn as well.

Claims 38, 39, 47, 51, 52, 57, 59 and 35 U.S.C. § 102(b)

Claims 38, 39, 47, 51, 52, 57, and 59 are rejected under 35 U.S.C. § 102(b) as being anticipated by Matsuo.

A. Claims 38, 39, and 47

Applicant has amended claim 38 to recite a polymeric chemically amplified resist comprising a methacrylate component and a polymerizable photoacid generating component wherein the methacrylate component does not comprise a photoacid generating moiety and the polymerizable photoacid generating component does not comprise a styrene moiety. Support for the present amendment is found in the specification on page 18, line 29 through page 19, line 25; and in Example 13 found on page 40 of the specification.

Matsuo does not describe or teach a polymerizable photoacid generating component that does not comprise a styrene moiety. Each polymerizable photoacid generating component disclosed in Matsuo comprises a styrene moiety. As a result, Applicant respectfully asserts that claim 38 is not anticipated by Matsuo. As claims 39

and 47 depend from and further limit claim 38, Applicant respectfully asserts that these claims are also not anticipated by Matsuo and respectfully requests that the rejection of these claims be withdrawn as well.

B. Claims 51, 52, 57, and 59

Claim 51 recites a lithographic process comprising a recording medium comprising the chemically amplified resist of claim 38. Matsuo does not describe or teach a lithographic process which utilizes a recording medium comprising the chemically amplified resist recited in claim 38. As a result, Applicant respectfully asserts that claim 51 is not anticipated by Matsuo. As claims 52, 57, and 59 depend from and further limit claim 51, Applicant respectfully asserts that these claims are also not anticipated by Matsuo and respectfully requests that the Examiner withdraw the rejection of these claims as well.

Claims 38, 42, 43, 47, 48, 51, 55, and 62 and 35 U.S.C. § 102(e)

Claims 38, 42, 43, 47, 48, 51, 55, and 62 are rejected under 35 U.S.C. § 102(e) as being anticipated by Wu Adv.

A. Claims 38, 42, 43, 47, and 48

As previously discussed, Applicant has amended claim 38 to recite a chemically amplified polymeric resist comprising a methacrylate component and a polymerizable photoacid generating component wherein the methacrylate component does not comprise a photoacid generating moiety and the polymerizable photoacid generating component does not comprise a styrene moiety. Wu Adv does not describe or teach a chemically amplified polymeric resist containing a methacrylate component wherein the methacrylate component does not comprise a photoacid generating moiety. Wu Adv does not teach a chemically amplified resist at all. The resist described in Wu Adv comprises a radiation sensitive polymer that does not operate under according to acid

catalyzed solubility changes. The resist in Wu operates according to solubility changes effectuated by the radiation induced cleavage of an ionic component in the radiation sensitive moiety. As a result, Applicant respectfully asserts that claim 38 is not anticipated by Wu Adv and respectfully requests that the Examiner withdraw the present rejection. As claims 42, 43, 47, and 48 depend from and further limit claim 38, Applicant respectfully asserts that these claims are also not anticipated by Wu Adv and respectfully requests that the Examiner withdraw the rejection of these claims as well.

B. Claims 51, 55, and 62

Claim 51 recites a lithographic process comprising a recording medium comprising the chemically amplified resist of claim 38. Wu Adv does not describe or teach a lithographic process which utilizes a recording medium comprising the chemically amplified resist recited in claim 38. As a result, Applicant respectfully asserts that claim 51 is not anticipated by Wu Adv. As claims 55 and 62 depend from and further limit claim 51, Applicant respectfully asserts that these claims are also not anticipated by Wu Adv and respectfully request that the Examiner withdraw the rejection of these claims as well.

Claim 34 and 35 U.S.C. § 103(a)

Claim 34 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu in view of Moran. Claim 34 recites an integrated circuit prepared by the lithographic process of claim 30. The lithographic process of claim 30 employs a polymeric chemically amplified resist comprising a methacrylate component, a polyhedral oligosilsesquioxane component, and a photoacid generating component.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Wu does not teach or suggest a chemically amplified resist comprising a photoacid generating component. The resist in Wu operates by a chain scission mechanism which precludes the need for a photoacid generating component.

Moreover, Moran fails to cure the deficiencies of Wu. Moran describes a resist comprising an x-ray curable material consisting essentially of a mixture of a first polymer [poly(2,3-dichloro-1-propyl acrylate)] and a second polymer [poly(glycidyl methacrylate-co-ethyl acrylate)]. The polymeric components of the resist undergo a crosslinking mechanism when exposed to x-ray radiation. The curing of the resist in Moran effectuates solubility changes, which are required for development of the resist. By operating under polymeric crosslinking principles, Moran does not teach or suggest a photoacid generating component as is necessary for a chemically amplified resist.

Additionally, Applicant respectfully asserts that Wu and Moran are not properly combinable references. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Wu and Moran are not properly combinable since their respective teachings are inherently inconsistent. Wu teaches polymeric resist which operates by chain-scission principles upon exposure to x-ray radiation while Moran teaches a polymeric resist which operates by crosslinking considerations upon exposure to x-ray radiation. The divergent principles under which the resists operate precludes a proper combination to arrive at the invention recited in claim 34.

Furthermore, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Modification of Wu to arrive at the resist recited in claim 34 changes the principle of operation of the resist in Wu. The modification would necessitate that the resist in Wu operate according to chemical amplification principles as opposed to chain-scission principles. As a result, the teachings of Wu are insufficient to render claim 34 obvious.

As a result, for the foregoing reasons, Applicant respectfully asserts that claim 34 is patentable over Wu in view of Moran and respectfully requests that the present rejection be withdrawn.

Claims 30-32, 35, and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pyun in view of Wu. The lithographic process of claim 30 employs a polymeric chemically amplified resist comprising a methacrylate component, a polyhedral oligosilsesquioxane component, and a photoacid generating component. Pyun does not teach or suggest a chemically amplified polymeric resist comprising a photoacid generating group. As acknowledged by the Examiner,⁴ Pyun does not address a polymer for use in a lithographic process. As a result, Pyun is precluded from teaching or suggesting a lithographic process involving a polymeric resist. Moreover, Wu fails to cure the deficiencies of Pyun. As previously discussed, Wu discloses a polymeric resist which operates by chain-scission principles and is, therefore, not a chemically amplified resist. Accordingly, Wu does not teach or suggest polymeric resist comprising a photoacid generating component as recited in claim 30. For the foregoing reasons, Applicant respectfully asserts that claim 30 is patentable over Pyun in view of Wu and respectfully requests that the Examiner withdraw the present rejection. As claims 31, 32, 35, and 37 depend from and further limit claim 30, Applicant respectfully asserts that these claims are additionally patentable over Pyun in view of Wu and respectfully requests that the Examiner withdraw the rejection of these claims as well.

Claim 34 and 35 U.S.C. § 103(a)

Claim 34 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pyun in view of Wu. As discussed above, claim 34 incorporates the lithographic process of claim 30. In view of the discussion of claim 30 in relation to Pyun and Wu in the preceding section, Applicant respectfully asserts that claim 30 is patentable over Pyun in view of Wu. As claim 34 incorporates the lithographic process of claim 30, Applicant respectfully asserts that claim 34 is patentable over Pyun in view of Wu and respectfully requests that the present rejection be withdrawn.

Claim 37 and 35 U.S.C. § 103(a)

⁴ Office Action Mailed November 2, 2004, page 18

Claim 57 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu Adv in view of Kinoshita. Applicant respectfully asserts that Wu Adv and Kinoshita are not properly combinable references. It is improper to combine references where the references teach away from their combination. *In re Grasselli, supra*. Wu Adv and Kinoshita are not properly combinable since their respective teachings are inherently inconsistent. Wu Adv teaches a polymeric resist comprising an ionic radiation sensitive moiety that undergoes a polarity change upon exposure to radiation. The polarity change results from radiation induced cleavage of the ionic group in the radiation sensitive moiety. The cleavage of the ionic group renders the exposed polymeric regions insoluble in the developing solution. Accordingly, the resist is classified as a negative resist.

Kinoshita, however, teaches a positive chemically amplified polymeric resist. Radiation exposed areas of the resist undergo a solubility change effectuated by the production of an acid from a photoacid generating group. The polymeric resist comprises organic moieties that are cleaved upon exposure to an acid. The cleavage of the organic moieties generates the solubility change permitting development of the resist. The divergent principles under which the resists in Wu Adv and Kinoshita operate precludes their combination to arrive at the invention recited in claim 57.

Additionally, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti, supra*. Claim 57 incorporates the lithographic process of claim 51. The lithographic process of claim 51 comprises a polymeric chemically amplified resist comprising a methacrylate component and a polymerizable photoacid generating component. Modification of the polymeric resist disclosed in Wu Adv to arrive at the polymeric chemically amplified resist of claim 57 would change the principle of operation of the resist in Wu Adv. As previously discussed, the resist in Wu Adv does not operate according to chemical amplification. Its efficacy is based upon radiation induced cleavage of the ionic component of a radiation sensitive moiety. Modification of the resist described in Wu Adv to operate by chemical amplification would preclude a resist solubility change based on the cleavage of the ionic component.

Furthermore, if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). As previously discussed, the resist described in Wu operates as a negative resist. Modification of the resist in Wu Adv to reflect a resist as recited in claim 57 changes the resist from a negative resist to a positive resist thereby rendering it unsatisfactory for its intended purpose of serving as a negative resist.

In view of the foregoing, Applicant respectfully asserts that claim 57 is patentable over Wu Adv in view of Kinoshita and respectfully requests that the Examiner withdraw the present rejection.

Claims 6, 7, 14-17, 19, 20, 74-79, 81, and 82 and 35 U.S.C. § 103(a)

Claims 6, 7, 14-17, 19, 20, 74-79, 81, and 82 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Angelopoulos in view of Haddad. Applicant has cancelled claims 6, 7, 15, 16, and 74 rendering the present rejection of these claims moot.

Applicant has amended claim 14 to recite a lithographic process comprising a lithographic recording medium wherein the lithographic recording medium comprises a nanocomposite resist comprising a nanoparticle component and polymer component, the nanoparticle component comprising a polyhedral oligosilsesquioxane and the polymer component comprising poly(α -chloroacrylate-co- α -methyl styrene).

Angelopoulos does not teach or suggest a lithographic recording medium consistent with that recited in claim 14. The resist compositions provided by Angelopoulos are acid-catalyzed resists comprising a radiation sensitive acid generator and are characterized by the presence of SiO-containing polymer. The chemically amplified nature of the resists described in Angelopoulos precludes Angelopoulos from teaching or suggesting the resist of claim 14. The resist recited in claim 14 comprises poly(α -chloroacrylate-co- α -methyl styrene), which operates by chain scission and not chemical amplification (acid-catalysis). Applicant respectfully asserts that a chemically amplified resist does not teach or suggest a chain scission resist as the two operate according to divergent principles.

Moreover, modification of Angelopoulos to arrive at the resist claim 14 changes the principle of operation of the resist in Angelopoulos. Modification of Angelopoulos to reflect the resist of claim 14 would change the resist in Angelopoulos from one that operates according to chemical amplification (acid-catalysis) to a resist that operates according to chain-scission principles. As a result Applicant respectfully asserts that Angelopoulos does not teach or suggest a lithographic recording medium consistent with that of claim 14.

Furthermore, Haddad does not cure the deficiencies of Angelopoulos. Haddad describes hybrid organic-inorganic thermoplastics and does not address polymeric materials suitable for use as lithographic recording media. The Examiner recognizes the patentability of the resist recited in claim 14 by stating "none of the cited prior arts teaches or suggests the present combination of a polyhedral oligosilsesquioxane and poly(α -chloroacrylate-co- α -methyl styrene)."⁵


In view of the foregoing, Applicant respectfully asserts that claim 14 is patentable over Angelopoulos in view of Haddad. As claims 17, 19, 20, 75-79, 81, and 82 depend from and further limit claim 14, Applicant respectfully asserts that these claims are additionally patentable over Angelopoulos in view of Haddad and respectfully requests that the Examiner withdraw the rejection of these claims as well.

CONCLUSION

For the foregoing reasons, an allowance of the claims is respectfully solicited. The Examiner is respectfully invited to contact J. Clinton Wimbish at (336) 607-7399 to discuss any matter relating to this application.

Respectfully submitted,

12/29/04
Date


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⁵ Office Action Mailed November 2, 2004, page 24, § 36.